

## Patent claims

1. Apparatus for receiving a data stream (102) which  
can be transmitted via at least one data  
5 transmission path (101, 101a, 101b, 101c), having:
  - a) a data stream receiver (100) for receiving the  
data stream (102);
  - b) a power delay profile determination unit (303)  
10 for determining at least one power delay  
profile (300);
  - c) a peak value detection device (501) for  
detecting at least one peak value (401a-401n)  
in the determined power delay profile (300);
  - d) a data transmission path profile determination  
15 device (502) for determining a data  
transmission path profile for the at least one  
data transmission path (101);
  - e) a filtering device (503) for suppressing shadow  
transmission path signals (101s) and for  
20 outputting a finger positioning signal (504);  
and
  - f) a setting device (305) for setting data  
transmission paths (101), which are associated  
with a data transmission, on the basis of the  
25 finger positioning signal (504).
2. Apparatus according to claim 1,  
characterized  
in that the peak value detection device (501) has  
30 a comparison unit for comparing the power delay  
profile (300) with a first threshold value (103a).
3. Apparatus according to claim 1,  
characterized  
35 in that a power delay profile determination unit  
(303) for determining at least one power delay  
profile (300) for the at least one data  
transmission path (102) is additionally provided.

4. Apparatus according to claim 1,  
characterized  
in that the data stream receiver (100) accepts  
5 data streams (102) via at least two different data  
transmission paths (101a, 101b).
5. Apparatus according to claim 1,  
characterized  
10 in that the peak value detection device (501) has  
a threshold value setting unit which can be used  
to set the first threshold value (103a)  
adaptively.
- 15 6. Apparatus according to claim 1,  
characterized  
in that the data transmission path profile  
determination device (502) has a data transmission  
path profile unit (502a) for summing weighted peak  
20 values (401a-401n) and a data transmission path  
detection unit (502b) for detecting a valid data  
transmission path.
- 25 7. Apparatus according to claim 1,  
characterized  
in that the power delay profile determination unit  
(303) is provided together with a peak value  
sorting unit (701) in a common matched hardware  
block (602).
- 30 8. Apparatus according to claim 1,  
characterized  
in that a received signal strength determination  
unit (606) for determining the received signal  
35 strength of the received signal (301) is provided  
in a matched hardware block (602).

9. Method for receiving a data stream (102) transmitted via the at least one data transmission path (101, 101a, 101b, 101c), having the following steps:
- 5 a) the data stream (102) is received in a data stream receiver (100) via at least one data transmission path (101, 101a, 101b, 101c);
  - b) at least one power delay profile (300) is determined using a power delay profile
  - 10 determination unit (303);
  - c) at least one peak value (401a-401n) in the determined power delay profile (300) is detected using a peak value detection device (501);
  - 15 d) a data transmission path profile for the at least one data transmission path (101, 101a, 101b, 101c) is determined in a data transmission path profile determination device (502);
  - 20 e) shadow transmission path signals (101s) are suppressed and a finger positioning signal (504) is output by a filtering device (503); and
  - f) data transmission paths (101, 101a, 101b,
  - 25 101c), which are assigned to a data transmission, are set on the basis of the finger positioning signal (504) using a setting device (305).
- 30 10. Method according to claim 9, characterized in that a first threshold value (103a) is set on a variable basis in the peak value detection device (501).
- 35 11. Method according to claim 10, characterized

in that the first threshold value (103a) is set on the basis of a noise environment.

12. Method according to claim 10,  
5 characterized  
in that the first threshold value (103a) is set on the basis of a mean value, a variance and/or a standard deviation for noise peak values (402a-402n).  
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13. Method according to claim 10,  
characterized  
in that the first threshold value (103a) is  
15 matched to a noise environment such that a preselection of possible data transmission path positions is provided.
14. Method according to claim 9,  
characterized  
20 in that the power delay profile estimation and the peak value detection are performed periodically by the peak value detection device (501).
15. Method according to claim 14,  
25 characterized  
in that the power delay profile estimation and the peak value detection are performed periodically by the peak value detection device (501) at an interval of time which corresponds to a data frame  
30 (203) or to a multiple of data frames (203).
16. Method according to claim 9,  
characterized  
35 in that the data transmission path profile determination device (502) stores a prescribable number (M) of preceding periods and sums the detected peak values (401a-401n) in the manner of an ongoing histogram.

17. Method according to claim 16,  
characterized  
in that the data transmission path profile  
5 determination device (502) stores the prescribable  
number (M) of preceding periods and weights the  
detected peak values (401a-401n) before summation  
with a received signal strength.
- 10 18. Method according to claim 9 or 17,  
characterized  
in that the temporal summation points when the  
detected peak values (401a-401n) are summed by the  
data transmission path profile determination  
15 device (502) correspond to delay positions ( $k = 0, 1, \dots, L-1$ ) of a correlation function.
19. Method according to claim 9 or 18,  
characterized  
20 in that data transmission path positions which  
appear fewer than a predetermined number ( $N_{occ}$ ) of  
times are set to zero.
20. Method according to claim 16,  
25 characterized  
in that a second threshold value (103b) is  
prescribed in the data transmission path profile  
determination device (502), and the peak values  
(401a-401n) summed in the manner of an ongoing  
30 histogram are compared with it.
21. Method according to claim 20,  
characterized  
in that the second threshold value (103b) is set  
35 on the basis of an existing noise.
22. Method according to claim 20,  
characterized

in that the second threshold value (103b) is provided on the basis of the first threshold value (103a), multiplied by a constant factor.

- 5    23. Method according to claim 9,  
characterized  
in that secondary maxima from a correlation filter  
are compared with a third threshold value (103c)  
in the filtering device (503) for suppressing  
10 shadow transmission path signals (101s).
24. Method according to claim 23,  
characterized  
in that the third threshold value (103c) is  
15 provided on the basis of the position of the  
strongest data transmission path (101, 101a-101c).
25. Method according to claim 10, 20 or 24,  
characterized  
20 in that the first, second and/or third threshold  
values (103a, 103b, 103c) are updated  
periodically.